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"..... per litora spargite muscum,
Naiades, et circùm vitreos considite fontes:
Pollice virgineo teneros hic carpite flores:
Floribus et pictum, divæ, replete canistrum.
At vos, o Nymphæ Craterides, ite sub undas;
Ite, recurvato variata corallia trunco
Vellite muscosis e rupibus, et mihi conchas
Ferte, Deæ pelagi, et pingui conchylia succo."
N. Parthenii Giannettasi, Ecl. 1.

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I.—*The Genera and Subgenera of the* Sciuropterus *Group, with Descriptions of Three new Species.* By Oldfield Thomas.

The old genus *Sciuropterus*, as already indicated by Forsyth Major and Heude, contains a very heterogeneous collection of forms, and a study of them brings me to the conclusion that they should be divided into at least six genera. Heude has already erected the genus *Trogopterus* for the remarkable Chinese species described as *Pteromys xanthipes* by Milne-Edwards.

Iomys, gen. nov.

Upper cheek-teeth subequal, square, with low ridges, the usual high internal antero-posterior ridge almost obsolete as a ridge, being represented by two separate cusps, to which respectively the two usual transverse ridges run directly across parallel to each other, instead of (as in *Sciuropterus*) converging and nearly meeting on the external slope of the highest part of the main antero-posterior internal ridge. As

a consequence the teeth appear from above to be simply quadricuspidate, and when viewed from their inner aspect show two definite cusps instead of the usual single crest.

No small upper premolar (p^3) present.

Usual antero-external cusp of p^4 situated more mesially on the tooth, so as to function partially as a p^3.

Bullæ well inflated.

Type—*Iomys horsfieldi* (*Pteromys* (*Sciuropterus*) *horsfieldi*, Waterh.).

Other species: *I. thomsoni*, Thos.; *I. davisoni*, Thos.

This genus is readily distinguishable from any member of the group by its peculiar quadricuspidate teeth and by the entire suppression of p^3.

Figures of upper and lower molars of *I. horsfieldi* have been given in Dr. Major's paper *.

Belomys, gen. nov.

Upper cheek-teeth brachyodont, but exceedingly complicated, as in *Trogopterus*, masking the essential pattern, which is, however, as in *Sciuropterus*. The ridges are deeply grooved, wrinkled, and excavated, and not only is the postero-internal cusp of each tooth separated by a deep notch from the main part of the inner longitudinal crest, but the anterior end of the same crest is cut off by another deep notch from the middle part. The inner aspect of m^1 and m^2 shows therefore three cusps—a small anterior, a middle larger, and a fairly developed posterior. Externally, where in some species of *Sciuropterus* there is a small supplementary cusp at the exit of the middle valley, there is a well-marked externally projecting angle, deeply grooved down its centre, so as to form a projecting gutter. p^4 not immensely large as in *Trogopterus*, but nevertheless larger than m^1; p^3 comparatively large, internal to the front cusp of p^4.

Ears large, their bases in the known species with tufts of bristles.

Type—*Belomys pearsoni* (*Sciuropterus pearsoni*, Gray).

Other species: *B. villosus*, Blyth, from Upper Assam, which is probably different from the Darjiling *B. pearsoni*; *B. kaleensis*, Swinhoe, from Formosa; and the Manipur species described below.

This form was included in *Trogopterus* by Heude on the statement by Forsyth Major that its molars were of similar pattern †; but it appears to me that the hypertrophy of p^4 in

* P. Z. S. 1893, p. 194, pl. viii. fig. 21 and pl. ix. fig. 21.

† *T. c.* pl. viii. fig. 20 and pl. ix. fig. 20.

Trogopterus xanthipes is a character of generic rank, while in addition that species is to a certain extent hypsodont, which is not the case in *Belomys*.

With less complicated teeth than *Belomys*, though still much more so than in *Sciuropterus*, is

PTEROMYSCUS, gen. nov.

Molars agreeing with those of *Belomys* in their general structure, but the degree of complication is less. Thus, among other details, there is no notching off of an anterior portion of the inner longitudinal boundary-wall, and the spout-like projection in the middle of the outer edge is less developed.

p^4 a little smaller than in *Belomys*, barely or not equalling m^1 in area. p^3 minute, closely crushed against the antero-internal side of p^4, and often hardly visible from above. It is present in all the skulls available, but looks as if it could hardly be of any functional value.

Ears quite small, untufted.

Type—*Pteromyscus pulverulentus* (*Sciuropterus pulverulentus*, Günth.).

A second species described below.

PETAURILLUS, gen. nov.

Molars with very low, rounded, and almost obsolete ridges, quite different from the high and well-defined ridges present in *Sciuropterus*, although their relative positions are much the same. The ridges not wrinkled or notched.

p^4 distinctly smaller than m^1; not of the usual triangular shape, but nearly symmetrical, its outer scarcely longer than its inner border. p^3 well developed, standing in front of the centre of p^4, not overlapped by it. The three anterior teeth of the row, therefore, evenly and symmetrically diminish in size forwards, a condition not found in any of the other groups.

Skull in general form short, broad, and low, with a short muzzle. Bullæ well swollen, the mastoid portion also slightly inflated.

Mammæ 4.

Type—*Petaurillus hosei* (*Sciuropterus hosei*, Thos.).

A second species described below.

The two species of *Petaurillus* are the pigmies of the group, being decidedly smaller than the smallest species of *Sciuropterus*. They are readily distinguishable by the straight

graduated series formed by their anterior cheek-teeth and by the low and rounded nature of their molar ridges.

The genera now admitted of the smaller flying-squirrels may be briefly indicated as follows:—

A. Molar pattern consisting essentially of two transverse ridges converging internally towards the central part of a longitudinal internal crest, though this structure is marked in the very wrinkled-toothed forms. Never as described under B.
  a. Teeth excessively wrinkled. An outwardly projecting angle developed at the middle of the external edge. Postero-internal cusp well developed.
    a^2. Teeth semihypsodont. p^4 very large, twice the size of m^1 ..... *Trogopterus.*
    b^2. Teeth brachyodont. p^4 not or little larger than m^1.
      a^3. p^3 well developed; p^4 rather larger than m^1. Ears large ..... *Belomys.*
      b^3. p^3 minute; p^4 rather smaller than m^1. Ears small ..... *Pteromyscus.*
  b. Teeth not excessively wrinkled. No projecting angle on outer edge. Postero-internal cusp rarely developed.
    c^2. p^4 generally a little larger than m^1. Molar ridges well developed ..... *Sciuropterus.*
    d^2. p^4 decidedly smaller than m^1. Molar ridges low and rounded ..... *Petaurillus.*
B. Molars each with two parallel transverse ridges rising into cusps laterally, so that the tooth appears evenly quadricuspidate from above, and shows two subequal conical cusps on its inner aspect. p^3 absent..... *Iomys.*

An alternative key may be based on the characters of the premolars only, as follows:—

A. Five cheek-teeth. p^3 present.
  a. Large premolar (p^4) approximately equal to or larger than first molar (m^1); p^3 standing internal to its anterior angle.
    a^2. p^4 very large, twice the size of m^1 ..... *Trogopterus.*
    b^2. p^4 not or little larger than m^1.
      a^3. p^3 small but functional.
        a^4. p^4 more complicated, the anterior of its three outer cusps highest; p^3 not visible externally ..... *Belomys.*
        b^4. p^4 less complicated, the antero-external cusp shorter; p^3 generally visible externally.... *Sciuropterus.*
      b^3. p^3 minute, apparently not functional ..... *Pteromyscus.*
  b. p^4 decidedly smaller than m^1; p^3 in front of its centre. *Petaurillus.*
B. Four cheek-teeth. p^3 absent..... *Iomys.*

But, further, the genus *Sciuropterus*, even as thus restricted,

needs further division into subgenera, of which there appear to me to be at least four. These may be distinguished as follows :—

A. Bullæ well inflated. Molar ridges high.
  a. Mammæ 8. (Holarctic.)
    a^2. Posterior transverse ridge of p^4, m^1, and m^2 deeply notched, so as to cut off a separate cusp in the centre of the tooth ..... *Sciuropterus.*
    b^2. Transverse ridges of teeth complete, as usual.... *Glaucomys.*
  b. Mammæ 6. (Oriental.)
    c^2. Bullæ well inflated, often double. Molar ridges complete ..... *Hylopetes.*
B. Bullæ low, flat, little inflated. Molars with lower ridges, their enamel usually much sculptured, and with supplementary cusps between the transverse ridges externally ..... *Petinomys.*

Subgenus Sciuropterus.

Teeth more complex than in other members of the genus, the cusps and ridges high and well defined. Internal wall of each tooth grooved on its lingual aspect, so as to be more or less divided into three, and approaching *Belomys* in this respect. Posterior transverse ridge of p^4, m^1, and m^2 deeply notched halfway across at right angles to its length, its dividing-line from the inner wall of the tooth also more deeply notched in; as a result a distinct conical cusp is isolated in the centre of the tooth. No similar structure is found in any other member of the group.

Skull: muzzle narrow, with parallel sides which are nearly at right angles to the spring of the zygomatic arch. Palatal foramina comparatively large.

Range. Palæarctic Region from Scandinavia to Japan.

Type—*Sciuropterus russicus*, Tiedem.

Other species: *S. momonga*, Temm.; *S. büchneri*, Sat.; *S. aluco*, Thos.

Glaucomys, subgen. nov.

Teeth comparatively simple; a slight tendency to the development of grooves on the lingual side of the internal wall. Posterior transverse ridges complete, partially joined internally to the outer slope of the internal wall, and without any notch halfway across the tooth.

Muzzle long, tapered forwards, its sides meeting the spring of the zygomata at a slant. Palatal foramina comparatively small.

Mammæ 8.

Range. North America and N.W. Himalayas.

Type—*Sciuropterus* (*Glaucomys*) *volans* (*Mus volans*, Linn.).

Other species: those of N. America, and also *S. fimbriatus*, Gray.

Extraordinary as the above-given range may appear to be, I can find no character of subgeneric importance to separate the large Himalayan *S. fimbriatus* from the N. American flying-squirrels, while both are equally distinct from the intervening species belonging to the restricted subgenus *Sciuropterus*.

Hylopetes, subgen. nov.

Teeth very much as in *Glaucomys*, though there is an increasing tendency, which culminates in the next group, for the enamel to be finely sculptured between and on the sides of the ridges.

Bullæ well inflated, sometimes doubled by the swelling up of the posterior mastoid portion.

Mammæ 6.

Range. Oriental Region from Nepal to the Malay Islands.

Type—*Sciuropterus* (*Hylopetes*) *everetti*, Thos.

Other species: *S. alboniger*, Hodgs.; *nigripes*, Thos.; *spadaceus*, Bly.; *phayrei*, Bly.; *aurantiacus*, Wagn.; *platyurus*, Jent.; *phæomelas*, Günth.; *tephromelas*, Günth.; *thomasi*, Hose.

Petinomys, subgen. nov.

Teeth with rather lower cusps and ridges than in true *Sciuropterus*, the enamel rather more elaborately sculptured, and with a more frequent development of accessory cusps, especially at the outer exit of the valley between the two main transverse ridges.

Skull broad and low, with a short muzzle. Bullæ fairly large horizontally, but peculiarly low and flattened, scarcely rising above the general level of the base of the skull, their substance unusually thick and opaque.

Mammæ 4 or 6.

Range. S. India and Ceylon, Malay Peninsula and islands.

Type—*Sciuropterus* (*Petinomys*) *lugens*, Thos.

Other species: *S. fuscocapillus*, Jerd.; *hageni*, Jent.; *mærens*, Mill.; *genibarbis*, Horsf.; *setosus*, Temm.; *vordermanni*, Jent.

I should have been inclined to consider the striking and peculiar flattening of the bullæ in this group as a generic

character, were it not that *S. fuscocapillus* and *S. thomasi* tend to be intermediate in this respect between *Petinomys* and *Hylopetes*.

The following new members of the group may be here described:—

Belomys trichotis, sp. n.

External characters apparently very much as in *B. pearsoni*, though the ears of the single specimen seem to be a little larger and more heavily tufted, and the hairs of the chest are whitish without the slaty bases present in all our other specimens of the group.

Skull with the nasals not surpassing posteriorly the frontal processes of the premaxillaries.

Molars conspicuously lighter than in *B. pearsoni*, the tooth-row not much shorter, but so much narrower that the palate-breadth between the premolars exceeds the combined length of p^4 and m^1, while in *pearsoni* the same breadth only equals the length of p^4 + half that of m^1. The teeth themselves are of essentially the same pattern, but owing to their smaller size appear much more finely sculptured.

Dimensions of the type (measured in skin):—

Head and body 196 mm.; tail 151; hind foot 32·5.

Skull: fronto-parietal suture to tip of nasals 28; nasals 12·2 × 6·5; interorbital breadth 8·1; intertemporal breadth 9·6; palatilar length 20; diastema 9·5; distance between inner sides of p^4 5·2; length of tooth-series 9, of molars only 6·2.

Hab. Manipur. Type from Machi.

Type. Adult male. B.M. no. 85. 8. 1. 136. Collected 7th May, 1881. Presented by Allan O. Hume, Esq.

Pteromyscus borneanus, sp. n.

Very closely allied to the Malaccan *P. pulverulentus*, Günth., to which, without examination of the skull, I have hitherto referred it. External characters very much as in that species, the upper colour of the same blackish brown flecked with light, but the light rings on the hairs which form the fleckings are smaller and more nearly white. Under surface of the body and of the basal third of the tail clearer whitish, without the subdued buffy or "clay-coloured" suffusion found in *pulverulentus*.

Skull rather larger than that of *pulverulentus*, the brain-case broader, and both the interorbital and intertemporal spaces noticeably wider.

Incisors broader and heavier, nearly one third broader than in equally aged examples of *pulverulentus*.

Dimensions of the type (from skin) :—

Head and body 290 mm. ; tail 215 ; hind foot 41.

Skull : greatest length 46 ; basilar length 37·5 ; greatest breadth 30 ; nasals 12·2 × 7·8 ; interorbital breadth 10 ; intertemporal breadth 12·3 ; breadth of brain-case 21 ; palatilar length 20 ; length of upper tooth-series (probably slightly reduced by age) 9.

Hab. Baram District, E. Sarawak.

Type. Old female. B.M. no. 91. 8. 28. 10. Collected in 1891 by Dr. Charles Hose.

Petaurillus emiliæ, sp. n.

Nearly allied to *P. hosei*, but smaller in all dimensions.

Colours in all respects quite like what the type of *hosei* would probably have had if it had not been skinned out of spirit, and therefore presumably discoloured. Thus the type of *emiliæ*, sent home as a skin, is paler rufous on the back (tips of hairs near vinaceous-cinnamon of Ridgway), and the belly is pure white, without the slight rufous tinge already suggested as possibly due to spirit. Cheeks pale buffy whitish, no darker line perceptible below the eye. In all other respects the original description of *hosei* will fit *emiliæ*.

Skull, apart from its markedly smaller size, quite like that of *hosei*, except that the nasals do not project backwards beyond the fronto-premaxillary processes.

Dimensions of the type (measured on the skin) :—

Head and body 72 mm. ; tail 62, its longest lateral hairs 7 ; hind foot 17.

Dimensions of an adult female in spirit :—

Head and body 68 mm. ; tail 67 ; hind foot 16 ; ear 15.

Skull (of type) : greatest length 24 ; basilar length 17·5 ; greatest breadth 15·2 ; length of nasals 6·1 ; interorbital breadth 6·5 ; palatilar length 9 6 ; length of upper cheek tooth-series 3·9, of true molar series 2·7.

Hab. Baram, E. Sarawak.

Type. Adult male. B.M. no. 3. 4. 9. 1. Collected 14th May, 1901, by Dr. Charles Hose.

Readily distinguishable from *P. hosei* by its much smaller size.

I have much pleasure in naming this pretty little flying-squirrel, the smallest member of the group, in honour of Mrs. Hose, the wife of the discoverer of its only near ally.